REMARKS

Claims 14 - 22 remain in this application. Claims 14, 16, 18, 19, and 20 have been amended.

Claims 14 and 16 were rejected under Section 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the examiner stated that claims 14 and 16 are rejected for a lack of antecedent basis for the phrases "the poly lactic acid based polymer with high melting point" and "the poly lactic acid based polymer with low melting point." Claims 14 and 16 have been amended to include: "one of the poly lactic acid based polymers having a melting point higher than the other poly lactic acid based polymer." Claims 14 and 16 have also been amended to improve the syntax of the claim. "High melting point" now reads --the higher melting point-- and "low melting point" now reads --the lower melting point--. Applicant submits that claims 14 and 16 as amended now conform to the statute and respectfully requests that the Section 112 rejection be withdrawn.

In further regard to the claim amendments, claims 14, 16, 18, 19, and 20 have been amended to include in the first line of each claim after the preamble that the base cloth is "for tufted carpet" to make explicit that the base cloth in the claims is a base cloth for tufted carpet. This limitation now appears in the body of the claim and should be given patentable weight.

Also, claims 14, 16, 18, 19, and 20 have each been amended such that in the poly lactic acid based polymers (being copolymers of D-lactic acid and L-lactic acid), now one of the D-lactic acid and L-lactic acid has a copolymerization mole ratio of 92 or more and less than 100 and the other has a copolymerization mole ratio of more than 0 and 8 or less.

Claims 14, 16, and 18 - 20 were rejected under Section 102(b) as being anticipated by, or alternatively under Section 103(a) as being unpatentable over EP 765,959 (Nagaoka et al., hereinafter "Nagaoka"). Also, claims 15, 17, and 21 were rejected under Section

103(a) as being unpatentable over Nagaoka. Applicant respectfully traverses these rejections based upon Nagaoka.

First, with respect to the present invention as currently amended, according to the present invention, in the poly-lactic acid based polymers constituting the base cloth for tufted carpet, the copolymerization mole ratio between L-lactic acid and D-lactic acid is in a specific range, that being, D-lactic acid/L-lactic acid greater than or equal to 92/8 and less than 100/0, and/or L-lactic acid/D-lactic acid greater than or equal to 92/8 and less than 100/0. The reason for using poly-lactic acid based polymers having a copolymerization ratio in the foregoing specific range is that such poly-lactic acid has a high melting point and high crystallinity.

Included herewith is a copy of a Japanese reference document entitled "Poly Lactic Acid" by H. Tsuji and Y. Ikada, published by KOBUNSHI KANKO KAI in 1997. At page 39, Fig. 2-27 shows a graph captioned "DSC curve of PLA having various optical purity." This graph is a reprint from "Macromolecules," vol. 125, p. 5719 (1992) by H. Tsuji and Y. Ikada. In this graph, the abscissa represents temperature and X_D indicates D-lactic acid mole ratio. That is, this graph shows DSC lines appearing when the mole ratio between D-lactic acid and L-lactic acid takes various values. Peak levels, shown in the graph, each represent crystallinity of poly-lactic acid of the mole ratio indicated, and the peak positions along the abscissa each indicate a melting point of a poly-lactic acid of the mole ratio indicated.

As is apparent from the graph, when the copolymerization ratio between L-lactic acid and D-lactic acid is set in a specific range as in the present invention as specifically stated above, the melting point and crystallinity is heightened, as compared with the case where the copolymerization ratio is set otherwise. In support of this, the foregoing reference document describes, at page 37, lines 18 to 21, "in PLA composed of a mixture of DLA and LLA at various mixing ratios, according as DLA content rate [X_D = DLA/(DLA + LLA)] approaches 0.5, that is to say, accordingly as optical purity and

stereoregularity lower, melting point and crystallinity lower, and crystallization stops in the range of X_D = 0.12 to 0.88 (Fig. 2-27)."

By selecting a specific poly-lactic acid having high melting point and high crystallinity as in the present invention, when high-speed spinning is performed by spun bonding, for example, a spinning force is produced in the manufacture of filament, which promotes poly-lactic crystallization and heightened crystallinity. Consequently, such a filament can be obtained that has crystallinity of 15 to 25 wt%, and further has birefringence index of $12x10^{-3}$ to $30x10^{-3}$ if the filament has a circular cross section. Thus, the filament constituting the base cloth is sufficiently crystalline-oriented, therefore being excellent in dimensional stability and mechanical performance, and moreover in thermal stability.

Attached with the Rule 116 Amendment mailed on August 22, 2003 was an illustration of a backing process as an example of one of the processes for manufacturing a tufted carpet in which a base cloth is planted with tuft yarns and then lined with a backing. In the backing process, a backing material melted with heat is laminated or coated on the base cloth side of the material obtained by planting tuft yarns in the base cloth, which is then dried by means of an oven to stiffen the backing material. In the backing process, the base cloth which contacts the thermally melted backing material is heated. Also, the backing material, having been laminated, is exposed to the heat of the oven used for drying. Thus, the base cloth is demanded to have thermal resistance against heat in the backing process, in other words, thermal stability with which the base cloth hardly deforms under heat in the backing process.

In the present invention, by selecting such poly-lactic acid based polymers having a copolymerization ratio in the range specified above, poly-lactic acid based polymer filaments having a specific crystalline structure can be obtained by way of spun-bond spinning, for example. The filaments have excellent properties such as dimensional stability, mechanical properties, and thermal stability, so that the base cloth obtained from such filaments exerts excellent thermal stability, i.e., thermal shrinkage of not more than

1% in both MD and CD directions under the conditions of 120°C for 3 minutes. Therefore, the base cloth can maintain necessary properties to sustain the severe backing process using heat.

Turning now to Nagaoka, Nagaoka discusses a copolymer of D-lactic acid and L-lactic acid from page 2, line 59 to page 3, line 5, but unlike the present invention, Nagaoka neither teaches nor suggests one of the D-lactic acid and L-lactic acid having a copolymerization mole ratio of 92 or more and less than 100 and the other having a copolymerization mole ratio of more than 0 and 8 or less.

Nagaoka exemplifies a use of a copolymer of D-lactic acid and L-lactic acid in Examples 8 and 27. Described in these Examples, however, is a nonwoven fabric having composite filaments using a copolymer of D-lactic acid and L-lactic acid for one component only. No such copolymer is used for the other component. This is distinctly different than the present invention. In addition, in these Examples, the copolymerization ratio of D-lactic acid and L-lactic acid is D-lactic acid/L-lactic acid = 10/90, which differs from the ratio range of the present invention.

As the aforementioned reference document "Poly Lactic Acid" by H. Tsuji and Y. Ikada describes that "crystallization stops in the range of X_D = 0.12 to 0.88 (Fig. 2-27)," poly-lactic acids crystallize only when the copolymerization ratio is in the range of 88/12 to 100/0. Besides, as depicted in Fig. 2-27, even if the copolymerization ratio slightly changes, the melting point and crystallinity largely change. For example, in Fig. 2-27, the line of X_D = 0.109 may be regarded as being approximate to the D-lactic acid/L-lactic acid = 10/90 of Nagaoka, whereas the line of X_D = 0.917 or X_D = 0.074 or X_D = 0.926 may be regarded as being approximate to the D-lactic acid/L-lactic acid = 8/92 or 92/8 defined as the lower limit of the ratio range in the present invention. From comparison of these lines, it is known that the poly-lactic acid based polymer of D-lactic acid/L-lactic acid = 10/90 of Nagaoka is lower in melting point by several tens of °C than the poly-lactic acid based polymer of the D-lactic acid/L-lactic acid = 8/92 or 92/8 of the present invention. Further, the crystallinity of Nagaoka is greatly lower than that of the present invention.

Accordingly, it is impossible, by using the poly-lactic acid based polymer of D-lactic acid/L-lactic acid = 10/90 of Nagaoka to achieve the excellent thermal stability properties of the base cloth of the present invention. Likewise, when using the poly-lactic acid based polymer of Nagaoka, it is impossible to achieve the properties required for sustaining the heat of the severe backing process.

Claim 22 was rejected under Section 103(a) as being unpatentable over the cited Nagaoka reference in view of EP 597,427 (Taniguchi et al., hereinafter "Taniguchi"). Applicant respectfully traverses this rejection. Taniguchi merely names carpets, at page 2, lines 16 through 26, as one of the products in which nonwoven fabrics are used. Thus, even if Nagaoka is combined with Taniguchi, the base cloth recited in claim 22 of the present invention is not suggested at all. That is, it is not taught or suggested from the combination of Nagaoka and Taniguchi to select poly-lactic acids having a specific copolymerization ratio as disclosed in the present invention. Further, it is not taught or suggested from the combination of Nagaoka and Taniguchi that thermal stability is achieved under the backing process, etc., by using the poly-lactic acids for a primary base cloth as disclosed in the present invention.

Applicant submits that the claimed invention clearly distinguishes over the cited references and should be found allowable.

This request for reconsideration is felt to be fully responsive to the comments and suggestions of the examiner and to place this application in condition for allowance. Favorable action is requested.

Respectfully submitted,

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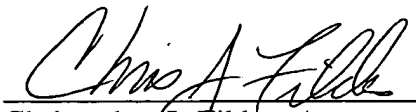

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